

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
December 15, 2014

Prepared by
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Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 15, 2014 07:00 to December 16, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), hydrochloric acid (HCl), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, particulate matter (10 micron particles, PM_{10}), sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems® AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. An additional unit (Unit 06) was deployed in conjunction with work operations near frac tanks as recommended by the onsite safety officer. Units 09 and 10 were deployed in the cab of front-end loaders supporting solidification operations in the Exclusion Zone. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S , and SO_2 . Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were collocated with AreaRAE stations 1, 2, 3 and 4 and data-logged to monitor PM_{10} . Table 3 summarizes data-logged particulate monitoring data. The monitor stationed with AreaRAE Unit 02 recorded one instantaneous detection of 3.676 mg/m^3 . This concentration was not sustained, and field personnel with handheld particulate monitors in the area reported concentrations of 0.015 mg/m^3 at 15:38 and 15:44 along the facility fence line.

Table 1: Manually-Logged Real-Time Air Monitoring Summary¹
December 15, 2014 07:00 – December 16, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Detection Range ²
Community	Cl ₂	Gastec 8La	6	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	27	0	NA	<1 ppm
	HCl	Gastec 14L	6	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	27	0	NA	<1 %
	O ₂	MR+ / MR Pro	27	27	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	6	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	27	27	0.011	0.003 - 0.023 mg/m ³
	SO ₂	MR+ / MR Pro	27	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	6	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	27	0	NA	<0.1 ppm
Exclusion Zone	Cl ₂	MR+ / MR Pro	2	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	2	0	NA	<1 %
	O ₂	MR+ / MR Pro	2	2	20.9	20.9 - 20.9 %
	SO ₂	MR+ / MR Pro	2	0	NA	<0.1 ppm
	VOC	MR+ / MR Pro	2	0	NA	<0.1 ppm
Work Area	Cl ₂	Gastec 8La	2	0	NA	<0.05 ppm
		MR+ / MR Pro	3	0	NA	<0.1 ppm
	H ₂ S	MR+ / MR Pro	29	0	NA	<0.1 ppm
	HCl	Gastec 14L	2	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	29	0	NA	<1 %
	O ₂	MR+ / MR Pro	29	29	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	2	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	29	29	0.014	0.002 - 0.02 mg/m ³
	SO ₂	MR+ / MR Pro	16	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	2	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	30	0	NA	<0.1 ppm

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 2: AreaRAE Air Monitoring Summary¹
December 15, 2014 07:00 – December 16, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range ²
Unit 01	H ₂ S	5585	7	0.1 ppm	0.1 - 0.1 ppm
	LEL	5585	0	NA	< 1 %
	SO ₂	5585	0	NA	< 0.1 ppm
	VOC	5585	2	0.3 ppm	0.3 - 0.4 ppm
Unit 02	H ₂ S	5601	94	0.1 ppm	0.1 - 0.2 ppm
	LEL	5601	0	NA	< 1 %
	SO ₂	5601	1	0.1 ppm	0.1 - 0.1 ppm
	VOC	5601	87	0.1 ppm	0.1 - 0.2 ppm
Unit 03	H ₂ S	5552	25	0.1 ppm	0.1 - 0.1 ppm
	LEL	5552	0	NA	< 1 %
	SO ₂	5552	0	NA	< 0.1 ppm
	VOC	5552	220	0.1 ppm	0.1 - 0.7 ppm
Unit 04	H ₂ S	5541	1	0.1 ppm	0.1 - 0.1 ppm
	LEL	5541	0	NA	< 1 %
	SO ₂	5541	0	NA	< 0.1 ppm
	VOC	5541	1	0.1 ppm	0.1 - 0.1 ppm
Unit 06	H ₂ S	2053	644	0.1 ppm	0.1 - 0.3 ppm
	LEL	2053	0	NA	< 1 %
	SO ₂	2053	0	NA	< 0.1 ppm
	VOC	2053	463	0.2 ppm	0.1 - 1.2 ppm
Unit 09	H ₂ S	1375	0	NA	< 0.1 ppm
	LEL	1375	0	NA	< 1 %
	SO ₂	1375	0	NA	< 0.1 ppm
	VOC	1375	6	0.2 ppm	0.1 - 0.4 ppm
Unit 10	H ₂ S	673	245	0.2 ppm	0.1 - 0.2 ppm
	LEL	673	0	NA	< 1 %
	SO ₂	673	0	NA	< 0.1 ppm
	VOC	673	0	NA	< 0.1 ppm

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 3: AM510 PM₁₀ Monitoring Summary¹
December 15, 2014 07:00 – December 16, 2014 07:00

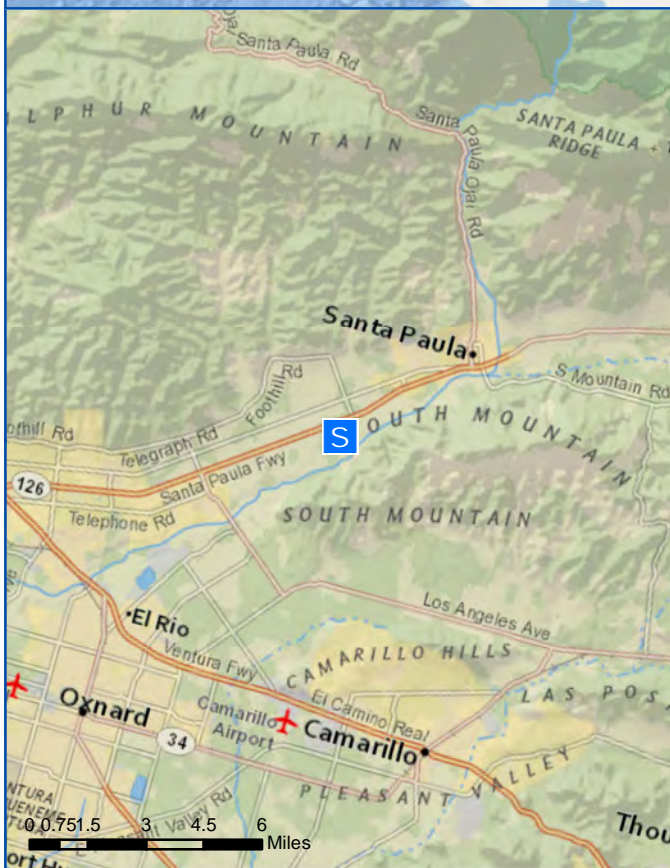
Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10601072	AR01	3407	3407	0.012	0.003 - 0.268 mg/m ³
10408087	AR02	2820	2781	0.028	0.001 - 3.676 mg/m ³
10704074	AR03	2659	2659	0.285	0.004 - 1.019 mg/m ³
10704072	AR04	2574	2567	0.01	0.001 - 0.062 mg/m ³

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Appendix A

Incident Maps:

Real-time Air Monitoring Locations and Incident Site



Legend

Site Location

0 50 100
Feet





Fixed Community Real-Time Air Monitoring Station Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

0 250 500 1,000
Feet





Legend

Monitoring Location

- Non-detect (< 0.1 ppm)
- Incident Site

0 0.125 0.25 0.5 Miles



Legend

Monitoring Location

- Non-detect (< 0.2 mg/m³)
- S Incident Site

0 0.125 0.25 0.5 Miles



Legend

Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles



Legend

Monitoring Location

- Detect (0.002 - 0.023 mg/m³)
- S Incident Site





Legend

Monitoring Location

- Detect (20.9 %)
- S Incident Site



Legend

Monitoring Location

- Non-detect (< 1 %)
- S Incident Site

0 0.125 0.25 0.5 Miles



Legend

Monitoring Location

- Non-detect (< 0.05 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles



Legend

Monitoring Location

- Non-detect (< 1 ppm)
- S Incident Site



Legend

Monitoring Location

- Non-detect (< 0.05 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and Location Map

0 50 100 Feet



Legend

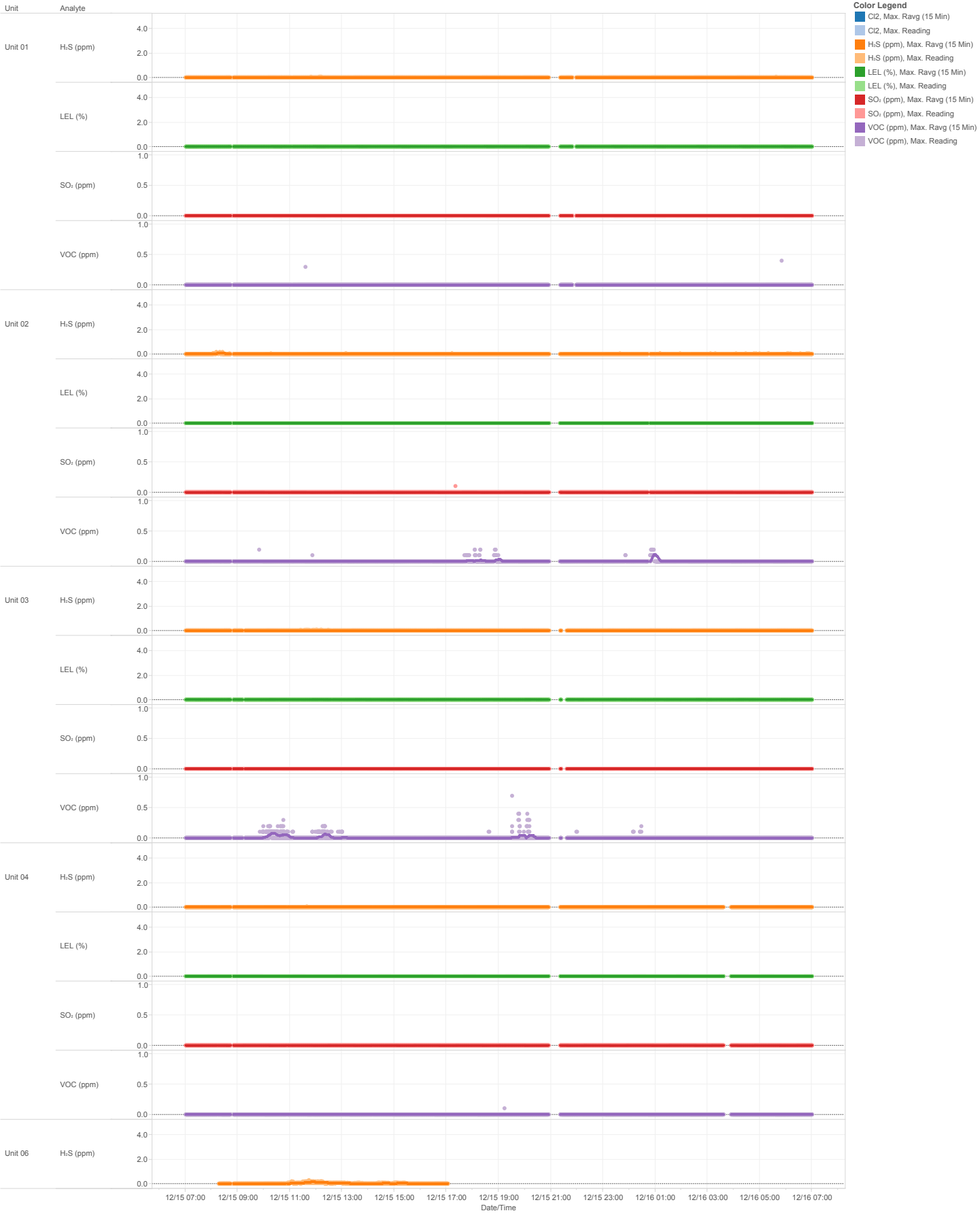


AreaRAE & AM510 Station



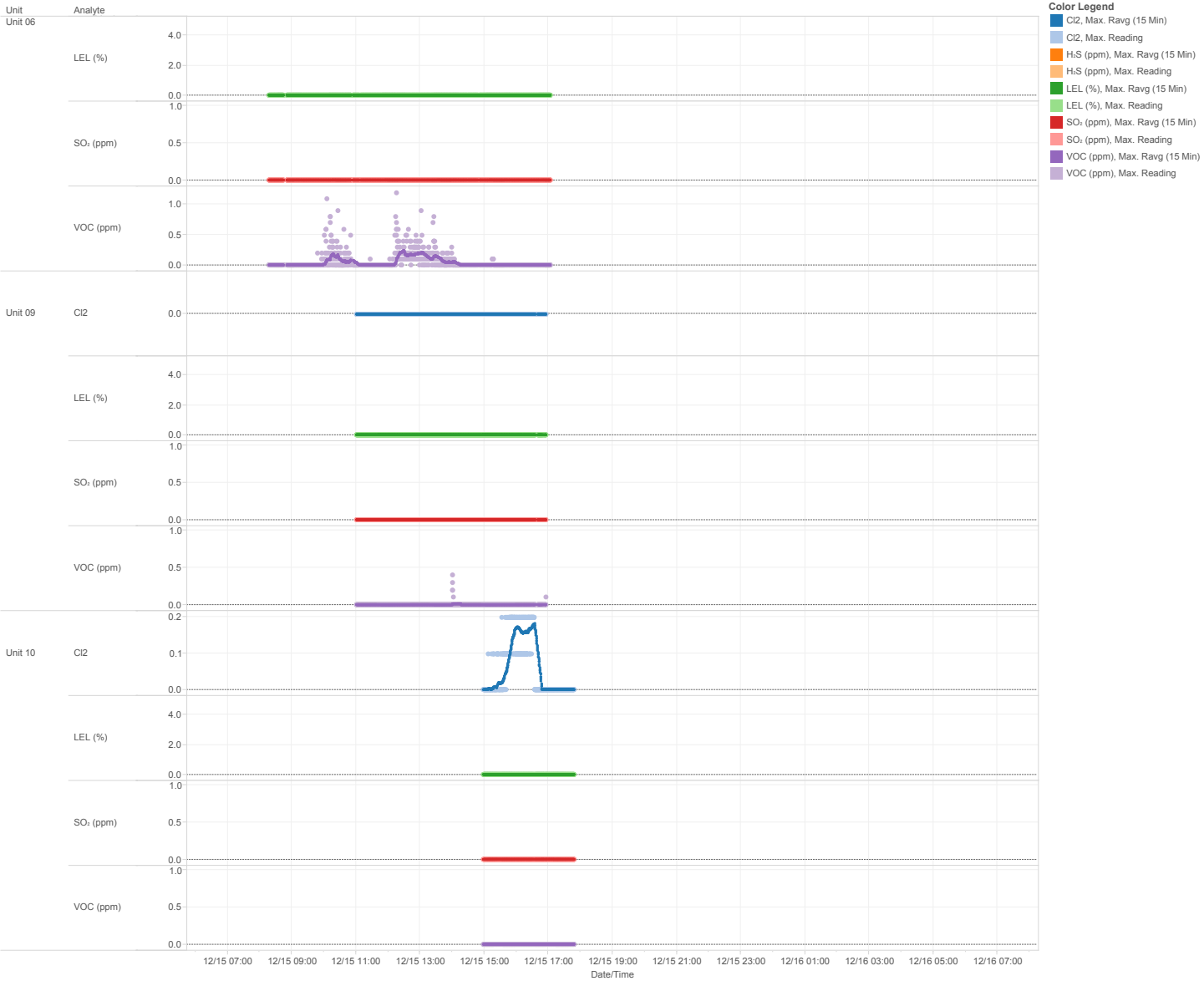
AreaRAE Station

Patriot Environmental
AreaRAE Trend Graphs
12/15/2014 07:00 - 12/16/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

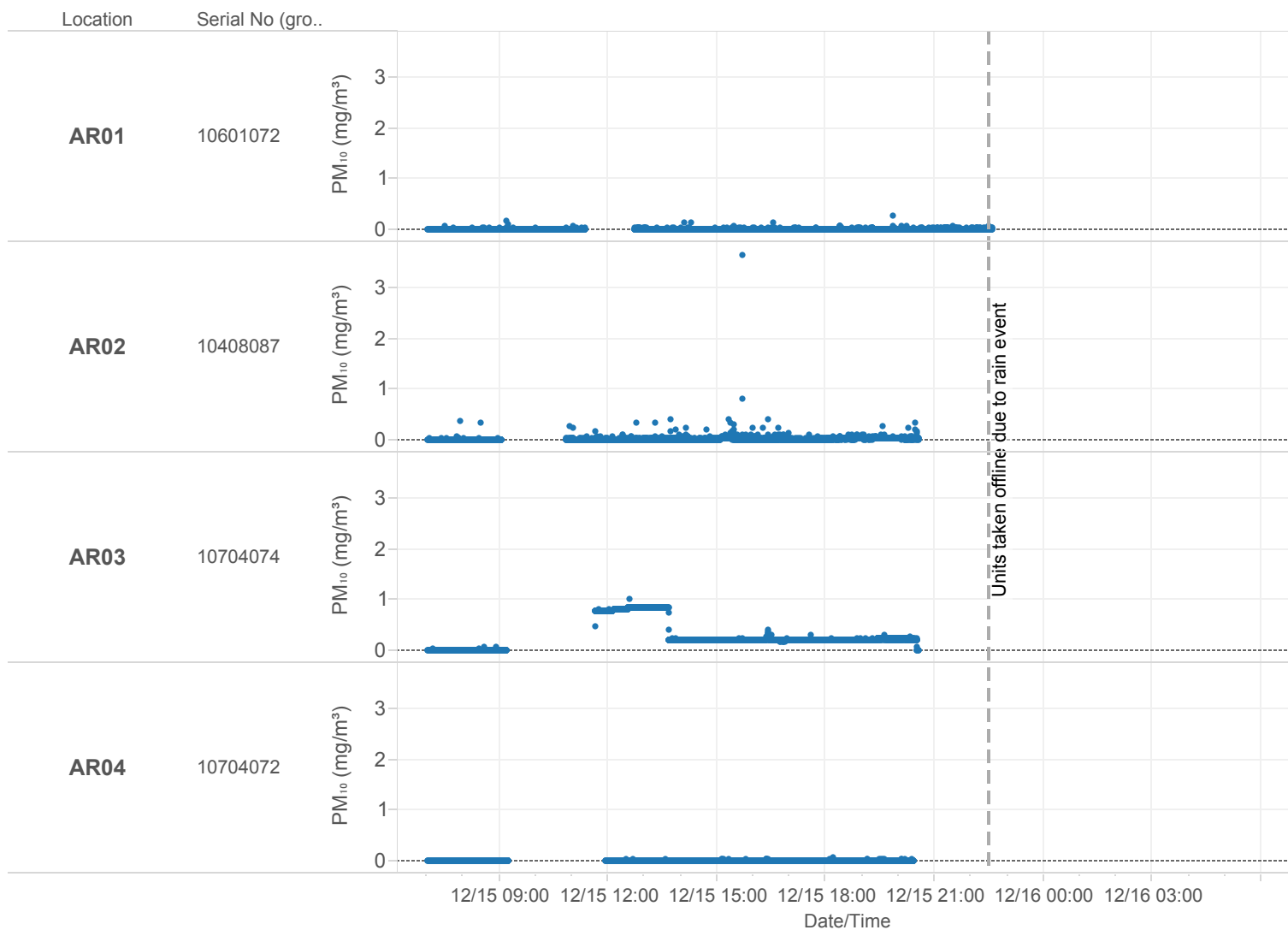
Patriot Environmental
AreaRAE Trend Graphs
12/15/2014 07:00 - 12/16/2014 07:00



- Color Legend
- Cl₂, Max. Ravg (15 Min)
 - Cl₂, Max. Reading
 - H₂S (ppm), Max. Ravg (15 Min)
 - H₂S (ppm), Max. Reading
 - LEL (%), Max. Ravg (15 Min)
 - LEL (%), Max. Reading
 - SO₂ (ppm), Max. Ravg (15 Min)
 - SO₂ (ppm), Max. Reading
 - VOC (ppm), Max. Ravg (15 Min)
 - VOC (ppm), Max. Reading

- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM₁₀) Summary
12/15/2014 07:00 - 12/16/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format